Microbiological stability and quality of pulsed light treated cantaloupe (Cucumis melo L. reticulatus cv. Glamour) based on cut type and light fluence

ABSTRACT

The aim of this study was to investigate the effect of cut type and pulsed light (PL) fluence on microbiological stability and quality of fresh-cut cantaloupes. Fresh-cut cantaloupes with various cut types (cuboid, triangular prism and sphere) were treated with PL technology at 6 J/cm2. Samples were exposed to PL treatment at fluences of 2.7, 7.8, 11.7 and 15.6 J/cm2 followed by storage at 4 ± 1 °C for 28 days. Microbiological quality, headspace composition, firmness, colour, pH, titratable acidity, total soluble solids, total phenolic content and ascorbic acid content of fresh-cut cantaloupes were determined. Spherical shape was found to be the most suitable shape for PL treatment of fresh-cut cantaloupes due to its significantly lowest (p Ò 0.05) microbial counts before and after the PL treatment. No significant (p > 0.05) effect was observed for firmness, colour, total soluble solids and total phenolic content of fresh-cut cantaloupes throughout the storage study. Pulsed light treatment using 7.8 J/cm2 was the best for extending shelf life of fresh-cut cantaloupes with extension of 8 days longer at 4 ± 1 °C compared to the control while maintaining the ascorbic acid content. In conclusion, PL treatment is a potential technique for extending the shelf life of fresh-cut cantaloupes by inactivating microorganisms without compromising the nutritional value.

Keyword: Pulsed light; Fresh-cut cantaloupe; Cut type; Microbiological stability; Non-thermal